

# WAKEBOARD BASE PLATE, FOOT BED, AND MOUNTING INTERFASTENER COMBINATION

## BACKGROUND OF THE INVENTION

### Field of the Invention

5           This invention pertains to the sport of wakeboarding, wherein a person is towed behind a high speed boat over water while standing on a specially made "wake" board. More particularly, this invention pertains to a unique set of foot bindings for attaching the operator's feet and legs to the wakeboard to provide the operator with the opportunity to perform superior stunts, tricks and maneuvers while on the board.

### Description of the Prior Art

10           The fields of skiing, snow boarding, wakeboarding, and wake skating appear to overlap in certain respects. In each sport, there is one operator standing on one piece (or, in the case of skis, two pieces) of wood or wood substitutes ("boards"), and each operator or user is motivated to use the boards to move quickly over the surface of water. In snow  
15           skiing and snow boarding the water is in the form of snow and ice while in the case of wakeboarding and wake skating the water is in its liquid form. Further, while snow skiing and snow boarding use gravity to power the user (downhill), wakeboarding and wake skating use the power of a motorized boat to drag or tow the user over a level  
20           surface of water.

20           Turning to wakeboarding and wake skating, the main difference is that, in wake

skating, the user stands on the board without the aid of any device to hold his or her feet to the skate, other than some friction-enhancing material such as grip-tape surfaces for traction. On the other hand, wakeboarding requires the use of mechanical attachments, mounted on the upper surface of the board, into which the operator slips his or her feet in order to stay firmly attached to the board during the ride. It is to the field of wakeboarding, more specifically a wakeboard baseplate, foot bed, and mounting washer combination that this foot binding invention is directed.

## **SUMMARY OF THE INVENTION**

The invention is a foot binding system and, more specifically, a wakeboard baseplate, foot bed or cushion, and mounting interfastener combinations used in the foot binding system. The invention includes a unique base plate, having a lower surface for contact with the upper surface of the wakeboard, and having an upper surface on which to mount the foot binding where the base plate forms a pair of arcuate slots, between the upper and lower plate surface, one slot located on each side of the foot binding, for registration with apertures formed in the foot binding and for receipt therein of threaded fasteners to allow the binding to be rotated, with respect to the base plate and the main axis of the wakeboard, and thereafter fixedly attached to the wakeboard to lock it against further rotational movement. In addition, the invention includes a novel foot bed or cushion, for placement on the base plate, that contains areas of different support materials to lessen the shock and make more comfortable the use with the operator's bare feet.

Further, the invention includes two novel interfasteners, one to fasten the base plate to the wakeboard and the other to fasten the binding to the base plate. The specification contains information other than this specific invention so as to make it understandable in its entirety.

5           Accordingly, the main object of this invention is a new foot binding for wakeboards that uses a novel baseplate, a novel foot bed and a novel mounting interfastener combination. The foot binding supports the foot of the user and is angularly adjustable along the main wakeboard axis and about the ankle of the user. The foot binding also cushions against unwanted discomfort, and attenuates shock to the foot during use of the board. These and other objects of the invention will become more clear when one reads the following specification, taken together with the drawings that are attached hereto. The scope of protection sought by the inventors may be gleaned from a fair reading of the Claims that conclude this specification.

### BRIEF DESCRIPTION OF THE DRAWINGS

15           Figure 1 is an illustrative picture of a person riding a wakeboard over the surface of the water;

            Figure 2 is a top plan view of the base plate that is attached to the wakeboard;

            Figure 3 is a bottom plan view of the base plate showing the foot cushion positioned thereover;

20           Figure 4 is a side elevation and bottom plan view of the first threaded interfastener

of this invention;

Figure 5 is a side elevation view of the rear ankle cover of the foot binding of this invention with a first, small, broken-out section, showing the thickness of the cover, and a second, small area showing the weave of the outer surface of the cover;

5 Figure 6 is a side elevation view of the inner front segment of the foot binding and its cover plate of this invention;

Figure 7 is an illustrative view of the wakeboard foot binding combination of this invention;

10 Figure 8 is a side elevation view of the outer binding segment of the foot binding combination of this invention;

Figure 9 is a perspective view of the foot cushion of this invention with a portion of the rear of the cushion separated and pulled upward to show the inner construction;

Figure 10 is a top plan view of the foot cushion shown in Figure 10; and,

15 Figure 11 is a perspective view of the foot binding-base plate second interfastener of this invention

## DESCRIPTION OF THE PREFERRED EMBODIMENT

Turning now to the drawings wherein elements are identified by numbers and like elements are identified by like numbers throughout the 11 figures, Figure 1 shows a person "A" using a wakeboard that contains a wakeboard foot binding combination of this invention. The wakeboard foot binding combination 1 of this invention is shown in

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Figures 2 and 3 to comprise a base plate 3, preferably made of metal and planar, having a lower surface 5 for contact with the upper surface 7 of the wakeboard 9 and an upper surface 13 on which to mount a foot binding 15. Base plate 3 has formed therein numerous holes, in order to lighten the overall weight without lessening the strength of the plate, and other holes that accept bolts or screws therein (not shown) allowing it to be tightly fastened to threaded or metal-lined holes (also not shown) formed in wakeboard upper surface 7. A pair of facing arcuate slots 17a and 17b are formed in base plate 3, between base plate upper surface 13 and lower surface 5, one along each side of base plate 3. One slot is located on each side of foot binding 15 for registration with threaded apertures 19 formed in wakeboard 9 and for receipt therethrough of a threaded fastener 21 to allow plate 3 to be rotated, with respect to the main axis, X-X, of wakeboard 9. Upon tightening fasteners 21, foot binding 15 becomes fixedly attached to base plate 3 and to wakeboard 9 and they are all locked together against further rotational movement.

A groove 25 is formed in base plate upper surface 13, opening outward and upward from each side edge of arcuate slots 17a and 17b for receipt therein of first foot binding-base plate interfastener means 27. As shown in Figures 2 and 4, one preferred form of base plate - wakeboard interfastener means 27 includes a curved fastener body 29, for interfitting closely in grooves 25 and further includes at least one, but preferably two, small area, spaced-apart pressure plates 31. Pressure plates 31 are formed in body 29 for concentrating the fastening pressure of a center fastener (machine screw) 31

downward, as shown, to small areas along the bottom of grooves 25 and into base plate 3.

The outer or peripheral edge 33 of base plate 3 extends outside or beyond arcuate slots 17a and 17b and partially outside the periphery of the foot of the user. In addition, slots 17a and 17b are of a width slightly greater than the threaded shaft of fastener 31 to  
5 allow unrestricted passage of the threaded shaft through plate 3 and into apertures 19. It is preferred that apertures 19 be lined with threads or a threaded sleeve (not shown) to prevent threaded fastener 31 from tearing or ripping out of the wakeboard during violent maneuvers by the wakeboard operator.

Foot binding 15 is made up of a number of components, each of which lends a  
10 specific function. Actually, there are two such foot bindings, one spaced to the side of the other, as shown in Figure 1, however, this description will be limited to one such binding as the second binding is identical in design and operation. As shown in Figures 5 and 6, an inner rear segment 37 is provided in foot binding 15 for covering the rear part of the foot that is inserted into the binding. Inner rear segment 37 includes a rear pad 39  
15 including a wide heel cover 41 and a centralized upwardly directed rear ankle cover 43, generally extending above heel cover 41. An outwardly directed, narrow, marginal edge 45 is provided having at least one, but preferably a plurality, of apertures 49 for receipt therethrough of foot binding - base plate interfastener means 51.

As shown in Figure 5, a reinforcement strap 53 is attached about heel cover 41 to  
20 provide reinforcement against excessive wear about the heel area of foot binding 15 due

to repeated inserting and withdrawing one's foot from the binding and against sideways stress placed against the heel area during violent wakeboard maneuvers. Further, inner rear segment 37 is shown in Figure 5 to be in the form of a slightly filled or thickened pad 55 having a smooth inner surface and a woven outer surface 57 to provide a measure of comfort to the foot and resistance to wear. In addition, reinforcement strap 53 is formed of an elastomeric material sewn in the marginal area about heel cover 41, as shown, to allow a certain amount of movement for the heel in the binding. Rear ankle cover 43 is preferably narrower than heel cover 41 and further includes a centralized upwardly extending loop 63 of tape or other such material, for use in grasping by one's fingers to help urge one's foot down into inner rear segment 37 when stepping into the binding.

As shown in Figures 6 and 7, foot binding 15 also includes an inner front segment 65 that is provided separately from inner rear segment 37 and includes a broad wraparound section 67, for placement just behind the toes of the user, left and right, about the upper part of the foot and down against base plate 3. A centralized narrower portion or flap 69 extends upward from the center of section 67, along the front of the ankle of the user, and includes a tongue 73. Tongue 73 is preferably attached to flap 69 through a flexible hinge 75. A marginal edge 77 and a crease 79 form side portions 81 that have holes 83 formed therein for receipt therethrough of foot binding - base plate interfastener means 51. Further, tongue 73 is shown to be in the form of a slightly filled or thickened pad 87 having a smooth inner surface and a hard-wearing, woven outer surface 89. Strips

91, of hard material such as plastic, having holes 93 formed therethrough, are provided to overlie side portions 81, and other side portions of foot binding 15, to facilitate the attachment of, and spread the stress of, foot binding - base plate interfastener means 51 to base plate 3.

5           Foot binding 15 also includes an outer binding segment 97, as shown in Figures 7 and 8, including a wraparound section 99 adapted to fit over a portion of inner rear segment 37 and inner front segment 65. An opening 101 is provided at the front of foot binding 15 for tongue 73 to be exposed and for adjustment of the fit. A marginal edge 103 surrounds outer binding segment 97 and contains attachment strips 105 having holes 109 formed therethrough for attachment with plastic strips 91 to base plate 3 by foot binding - base plate interfastener means 51. A plurality of pairs of hooks 111 and pairs of loops 113 are provided adjacent or facing the front portion of outer binding segment 97 where opening 101 will be formed after assembly of foot binding 15, for receipt therethrough of laces 115 to form a lace ladder for the user to draw foot binding 15 about the user's foot.

          Also as shown in Figures 7 and 8, means 117 is provided to adjust the angle " $\alpha$ " between the lower leg of the user and the main axis X-X of wakeboard 9. Means 117 includes a first strap or binding 121 passing from the lower inside area of outer binding segment 97, upwardly and around behind, or to the rear of, the user's ankle, and then continuing around segment 97 to the opposite side thereof and downwardly and forwardly



to the lower outside thereof. At least one strap adjustment means, including a buckle and ladder strap system 123, is located along strap 121 to provide a length adjustment feature thereto. A center metal loop 127 is centrally mounted high on outer binding segment 97 to aid in directing strap 121 about the binding.

5           A second strap adjustment means 129, in the form of a pair of straps 131 sewn into outer binding segment 97 and terminated with an adjustable metal clip 133, is provided for joining with adjustment means 117 to augment this adjustment feature in the angle. Such an adjustment feature allows the user to vary angle " $\alpha$ " of his or her lower leg with the main axis of wakeboard 9 in order to facilitate various tricks with the board.

10           As shown in Figures 3, 9 and 10, an elastic foot bed 137 is provided for use with foot binding 15. Footbed 137 is made up of a lower outsole 139 in the general outline of a sandal having a lower surface 141 bounded by an outer periphery 145 and an upper surface 147. On top of lower outsole 139, and in adjacent contact with upper surface 147, is a midsole 149, preferably having the same outline as foot bed 137 and extending  
15           upward, from upper surface 147 to form its own upper surface 151. In midsole upper surface 151 are formed two depressions. The first depression 153 is located in an area under the middle plantar area of the foot and second depression 157 is located in an area under the heel of the foot and both are filled with special elastomeric materials. In an area located under the foot, inside footbed outer periphery 145 and on top of midsole  
20           upper surface 151, first (filled) depression 153 and second (filled) depression 155, lies in

a bedlayer 161. Bedlayer 161 extends over middle plantar depression 153 and heel depression 155 and is added after said depressions are filled with elastomeric material.

As further shown in Figures 9 and 10, elastomeric materials with different physical properties are used in outsole 139, midsole 149, depression 153 filling, depression 157 filling and bedlayer 161. As an example, the elastomeric material making up outsole 139 is Adiprene® (American Urethane, 1905 Betson Court, Odenton, Maryland) with a hardness value ranging from 80A to 75D. The elastomeric material making up midsole 149 is EPDM rubber with an Asker value of A 60. The elastomeric material 159 used in middle plantar depression 153 is EPDM rubber with an Asker value of A 60. The elastomeric material 157 used in heel depression 155 is EPDM rubber with an Asker value of C 60. And, the elastomeric material making up bedlayer 161 is EPDM rubber with an Asker value of A 60. With respect to depressions 153 and 157, the elastomeric material inserted therein is either cut to fit, both in peripheral outline and thickness, or molded to fit. It is preferred that the top surface of the elastomeric material inserted therein is made planar with midsole upper surface 151.

As shown in Figure 3, means 163 is provided on the lower or action surface 141 of foot bed 137 to lock it against base plate 3 and prevent it from sliding thereon during operation of foot binding 15. As shown, means 163 comprises a first aperture 165 in plate 3, preferably located toward the middle of footbed 137, and further preferably having at least one straight or rectilinear side 169, preferably parallel to axis X - X,

formed therealong to help keep footbed 137 locked in position on plate 3 during violent side-to-side maneuvers. A like-formed first projection 171, of the same size and shape, is molded outward from lower surface 141 of footbed 137 and is adapted for insertion in first aperture 165. A second aperture 173 is formed in base plate 3, spaced-apart from first aperture 165, preferably above heel depression 155 and rearward of middle plantar depression 153 along axis X-X. A second projection 175, of the same size and shape, is molded outward from footbed lower surface 141 and is adapted for insertion in second aperture 173. Both projections 171 and 175 are arranged to extend into and fit tightly in first and second apertures 165 and 173 when footbed 137 is arranged on top of base plate 3. The weight of the user keeps projections 171 and 175 in apertures 165 and 173 during use.

A preferred embodiment of foot binding - base plate interfastener means 51 is shown in Figure 11 to be a threaded fastener provided for attaching marginal edges 45, 77 and 103 of foot binding 15 to base plate 3. As shown in Figure 11, the threaded fastener comprises a plate 177 of finite thickness, such as 1/16 inch thick steel, defined by first and second opposite sides, 181 and 183 respectively, and said plate 177 has an aperture 185 formed therethrough. An inside threaded sleeve 187 is formed integral with plate 177 and surrounds aperture 185. Sleeve 187 extends outward from first plate side 181 and has threads formed on the inside surface thereof. A machine screw 189, comprising a threaded shaft 193 with a flat screw head 195 formed at one end of the shaft, is provided

wherein the threads inside sleeve 187 and threads on screw shaft 193 match so that screw 189 can be threaded into sleeve 187 to hold inner foot binding 15 and said outer foot binding 15 to base plate 3.

5 While the invention has been described with reference to a particular embodiment, those skilled in the art will be able to make various modifications to the described embodiment of the invention without departing from the true spirit and scope thereof. It is intended that all combinations of elements and steps which perform substantially the same function in substantially the same way to achieve substantially the same result are within the scope of this invention.